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ABSTRACT

Current developments in the use of microcomputers to meet the learning needs of special education students are discussed. Examples are given of efforts of special projects (such as Project ReTool), Teacher Education Computer Centers in California, and local school districts in the training of teacher educators and special education teachers. Current activities of the commercial sector, the Department of Education, and other groups in the development and evaluation of software for instruction, management, and assessment are reviewed. The value of networking to share technology information is stressed. The role of the Council for Exceptional Children in special education technology is emphasized throughout. Among six recommendations are the need for software developed specifically for handicapped learners and the need for a system of sharing software developed for special needs children. (JW)

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Using Microcomputers to Meet the Learning Needs of Special Education Students

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School of Education
University of San Diego

Dr. DeForest L. Strunk

USING MICROCOMPUTERS TO MEET THE LEARNING NEEDS OF SPECIAL EDUCATION STUDENTS

The title of our presentation this afternoon is "Using Microcomputers to Meet the Learning Needs of Special Education Learners." It is further subtitled in your program "An Update of the Current Status of Computer Use in Special Education" will be presented.

The program this afternoon will look at three aspects using microcomputers with special education students. My paper will focus on stating "Today's Views on Special Education and Computers"; my colleague Carol Tennebaum will look at "Applications for Microcomputers in Special Education in San Diego County" and will give you the results of her research; and my colleague Sally Henry will present "What does the Research Demonstrate in Using Microcomputers with Learning Disabled Children."

I am unable to be with you today because of my responsility of teaching a class at the University of San Diego.

Introduction

Just as the rapid change in technology has influenced all of education, the same technology is having an impact on the delivery of services to handicapped children, youth and adults. While microcomputer technology has been extensively used in some isolated areas with handicapped persons during the past two or three years, in the main this technology has only recently come to the forefront as an area of concern to those who are delivering services to the handicapped and to other children with special learning needs.

The news is that professional special education and those persons responsible for the delivery of services to handicapped children and youth as well as other exceptional children, are entering the field of microcomputer technology. It wasn't until October, 1982 that the official journal of the Council for Exceptional Children (the umbrella organization serving exceptional children and youth and responsible for the delivery of services to such children) offered in their journal Exceptional Children the entire issue dealing with microcomputer technology and its applications to the special

learner. This was followed by the First National Conference on Microcomputers in Special Education sponsored by the Council for Exceptional Children in Hartford, CT in March, 1983. As a member of the Board of Governors of that organization I can tell you that the planners were indeed surprised when they had estimated that their audience would be from 750 to 1000 persons and instead over 2200 people appeared for that conference. It was not only a shock to the planners of the conference (as well as a delight to them) but also for the first time I believe effectively presented to both hardware and software manufacturers the vast potential market they had either purposely or ignorantly overlooked. It suggests to us that when we look at the update in this area we are really looking at fairly recent events. My comments to you today, while not intending to be presumptive, will look at some issues that I think we need to carefully examine.

It seems appropriate to look at this issue from three separate parameters. The first, Training of Special Educators; the second, The Development and Selection of Software; and the third, The Use of Network and Networking Processes.

For the most part, future trainers of special educators remain relatively unsophisticated about the applications and use of microcomputer technology and its application in the delivery of services to handicapped children and youth. While individuals in various colleges and universities as part of their professional training to become trainers of teachers have become involved as a result of some special project in the use of microcomputer technology, there has not been a concentrated effort on the part of colleges and universities who train future special education professors to have adequate levels of competencies in microcomputer technology or indeed in other of the associated technologies. The Council for Exceptional Children, the umbrella organization dealing with services for all exceptional children, 2½ years ago started a project entitled "ReTool". This project had as its goal the development of updated experiences and updated training for those responsible for such training in colleges and universities throughout the United States. In the last year and a half,

this project focused on development of special workshops (of 1-day length) to update teacher trainers about microcomputer technology and its applications to special education. Essentially, these workshops deal with orientation to microcomputer technology, selection and evaluation of software, and application of such technology to meet the needs of the special learner. These workshops have been coordinated with the meetings of the Teacher Education Division of the Council for Exceptional Children and with the National Conferences of this organization. No data is available on the sophistication levels of teacher trainers particularly in the field of special education. Just this week I received a survey form from the University of Alabama where Dr. Charles Horn together with his colleagues are attempting to gather data on the use of microcomputer technology in terms of its use for university training programs in special education as well as for administrative purposes.

The special education faculty of some institutions of higher education developed expertise in microcomputer technology as a result of their own interests. For the most part the vast majority of those persons who are responsible for the training of special educators are at beginning levels of computer awareness apparently.

While I have been in the field of preparing special educators for a long period of time, it wasn't until I went on my sabbatical at the Diagnostic School for the Neurologically Handicapped in San Francisco, arriving the same day as three Apple computers, that my competencies were suddenly elevated. I had to learn something about microcomputers and software fast. I think the same thing is ture with many of my colleagues throughout the country.

However, all is not lost. Institutions of higher education, as part of their teacher training programs for special educators, are beginning to require or at least make optional special courses dealing with microcomputer technology and its applications to the special learner. One local representative of such a program is San Francisco State University where the Division in the Area of the Learning Handicapped

has placed a requirement for the program and the recommendation for credentialling in the area of the learning handicapped to have microcomputer competencies. The University of San Diego, while not having this as part of the requirements of the program, offers it as options to students enrolled in the various credential programs. The process is obviously occurring throughout the country. Last week, when using SpecialNet, the computer "bulletin board" listed two inquiries from institutions of higher education which were interested in devoloping such programs for their students.

Congruent with institutions of higher education's responsibilities in training teachers, there is also the responsibilities of the TEC Centers (Teacher Education Computer Centers). These newly developed centers throughout the State of California have responsibilities in providing a variety of microcomputer hardware, educational software, and educational literature. Coupled with such responsibility is also the offering of various courses dealing with microcomputers and their applications for learners. For the most part these centers direct their attention to the normal learner, particularly in the fields of science and mathematics, but there seems to be increasing involvement of special educators in the process.

Not to be excluded as well, is the recognition that local school districts in various parts of California, as illustrated by my colleague Carol Tennebaum's presentation, School Districts themselves are taking the lead in preparing their teachers for effectively delivering services to the children for whom they are responsible.

As a professor at an institution of higher education, it seems quite clear to me that in many instances the teachers who are delivering services to children have far greater competencies than many of those persons who are responsible for their training, indeed for their preparation.

The second major parameter on which I am requesting we focus is that on the development and selection of software. It is in this particular that I have the most to share with you. It is obvious that in this area we are going through the same

kinds of growth pains as occurred in the development of software for normal children. Much of the software initially developed for special learners was not very user-friendly. It was not specifically designed for use by handicapped children or adults. In many instances it was full of "all kinds of bugs" and failed to take into consideration "delay time" for those individuals who had problems in dealing with regular software and their adaptations. For the most part, early use of software for special learners was to adapt other programs that had been written for regular children. Some software has been written by some teachers in a particular site who had particular needs for certain kinds of children. Eventually, however, software has been developed by the commercial market, but much of it requires very careful scrutiny. There is currently on the market software which is theoretically designed to be used by the educationally retarded and the learning handicapped. While there are no bugs in the program, for the most part the software is dull and uninteresting to students who have relatively high sophistication levels as a result of television and arcade activities. The software is indeed palid by comparison.

Throughout the country individuals who have had the responsibility of dealing with the orthopedically handicapped and other physically impaired individuals have developed learning assistive devices such as special paddles, ping pong switches, adaptations of joysticks, special keyboard templates, and so on. What has happened, of course, is that these ideas had been shared, adapted, borrowed, and copied. As a result, there are now commercial firms producing these same kinds of materials which can be used by those individuals who may have special physical limitations.

The Prentke-Romich Company, producers of electronic aids for the severely handicapped, is but one example. In the past year and a half, an amazing number of new software programs have made themselves known to the general market. In the area of voice synthesizers, Echo-II Speech Synthesizer, Total Talk, from Maryland Computer Service, and the very newly released voice synthesizer from Borg-Warner by Systems 80 are examples. Special electronic visual aids, including large print computers by

such groups as Visualtek have been developed to assist the partially sighted. For those who are blind, Raised-Dot Computing produced Braille-Edit; another very involved system has been produced by TSI for the blind known as the Versa-Braille system. Teletypewriters (used for communication via telephone lines) have also been adapted for computer use.

At the most recent NECC (National Education Computer Conference) in Baltimore last June, a special adaptation was presented for a deaf-blind person using a microcomputer which transferred electronic signals into Morse code vibrations which were delivered tactically to the person using a flat surface attached to a shoehorn. As a result, this enabled the deaf-blind person not only to use a microcomputer with all its adaptations in terms of peripherals such as printers and so on, but he was also able to use a variety of bulletin boards and other network advantages. (If you are interested in reading this paper it is available from Proceedings of NECC-5, 1983.

The California School for the Deaf at Fremont offered its "Blocks '82" program which is a complete lesson-author... system for the Apple computer. It was designed primarily for use at California Schoo for the Deaf and enables all students to view the monitor and use even part of the keyboard. It allows educators to create lessons tailored to the precise needs of their students at any subject area and at any level of programming. (If you are interested you might contact Margaret Irwin at the California School for the Deaf, Fremont, California). If you are familiar with the program it now uses only one disc drive as opposed to two as in the previous edition.

More recently the Council for Exceptional Children has called for exemplary software which has been developed for the special learner.

The U.S. Office of Education put out an RFP (Request for Proposals) this summer for a complete authoring program for special learners. This is an indication that the Office of Special Education and Rehabilitation Services of the U.S. Department of Education is also entering this area to encourage the development of top flight software for children with special learning needs.

Compilations of available software have been developed by Linc Associates. This is essentially a private/public organization with direct contracts with the Office of Special Education and Rehabilitation Services. Linc most recently published a SpecialWare Directory, 1983 as a guide to software sources in special education.

In terms of management programs similar to the one my colleague Carol Tennebaum is presenting today, many software companies are producing management programs which can be used for collection of data to meet the needs of federal and state requirements. Several management programs are already on the market, some having various limitations, some having more than others.

The Special Education Resource Network (SERN) located in Sacramento has just received a sizable grant to develop comprehensive management systems to be used in the State of California. Janet Jameson of that office is director of this project.

Software has also been developed in the areas of assessment. Specific programs have been developed on a softswap basis in the area of aphasia and other areas as well as commercial software. There are a variety of programs available from Microsystems of North Carolina and Precision Products, which will enable you to analyze and provide data on a variety of assessment tools. These include the WISC-R (Weschler Intelligence Scale for Children-Revised), the PEAR, the Peabody (Error Assessment Device), the Woodcock-Johnson and the Woodcock Reading Mastery Test. A number of companies are producing IEP (Individual Education Program) program disks. An example of such is the Unistar Program produced by Microsystems.

I have tried to present to you an update of some of the developed software and yet I think we also have some concerns. One concern that we have is obviously software evaluation. It is a concern not only for regular educators but also for those of us delivering services to handicapped children and youth. The special educator is looking for software that has been designed specifically for special learners and at the same time is looking at that software that has been designed for normal learners together with its adaptations and applications for the special

learner. It is interesting that at the NECConference of which I spoke earlier, a paper was presented relative to software evaluation in which a statement was made that "all software evaluation should include evaluation of software in its applications to special needs children." It is obvious if you look at some of the software evaluation forms currently being used both in the State of California form and the one which appeared in Electronic Learner, special applications are not included. I was surprised to see that the 1983 revised California evaluation form used by the TEC Center still does not include this area.

The last area I want to look at is the whole concept of networking. I am not implying by this term that we are exclusively dealing with computer networks, but instead the whole process of dealing with other individuals to share information. As I previously indicated, the First National Conference on Microcomputers and Special Education sponsored by the Council for Exceptional Children was held in March of 1983. This was followed on April 26th here in the State of California by the Second Annual Special Education Microcomputer Faire held here in San Jose. Such conferences permit us to share our information. There is still a paucity of professional literature dealing with the topic of use of microcomputers in special education. While the current issue of American Annals for the Deaf has a rather thorough article on the use of interactive videodiscs and microcomputer technology at the California School for the Deaf at Riverside, such articles are indeed still rare. Another opportunity for networking which I believe is of particular import is SpecialNet operated by the National Association of State Directors of Education (NASDE). SpecialNet uses the Telenet system, contains a series of bulletin boards ad well as a mail system for special educators. There are a great many users of SpecialNet here in the State of California (including the State Department of Education) as well as nationally. The development of special interest groups (SIG) similar to the ones which have been developed by CUE (Computer Using Educators) allow us to share information in terms

of application about our computer technology and perhaps even more important, allows us to swap some of the public domain software or some software which we ourselves have developed.

The Council for Exceptional Children is continuing to invest in programs in technology. The Second Annual Conference on Technology will be held in Reno, NV on January 25-28 at the MGM Grand Hotel. Further, the President of CEC has established a national task force on Technology in Special Education (August 30, 1983). A new Division of Technology and Media has been proposed for the CEC and will be voted upon at its next annual meeting in Washington, D.C. in April, 1984.

At this point you are probably asking "Where does all this lead us?" I have some serious concerns about the entire field as probably you do. I would like to suggest and make a few proposals of some things we really ought to examine and attempt to bring about:

(1) Carefully designed software should be developed specifically for handicapped learners. Software designed for normal learners should take into consideration the needs of special learners.

(2) There should be increased levels of dissemination of information regarding special education applications, special technology, and software. I am suggesting that the Fall conference of the California State Federation/Council for Exceptional Children to be held in Oakland, CA include a computer strand as part of the program. Further, that this organization CUE assist in the development of this computer strand. Tangential to this proposal, I am suggesting that the TEC Centers include added software for special learners and be sensitive to this area. I am also urging that the TEC Centers include training for teachers who have children with special learning needs.

(3) Perhaps my most important proposal is that we should set up some kind of system to enable us to share software which has been developed for special needs children. If a national or statewide clearinghouse could be set up by such organizations as CUE or CEC, I am sure we would stop re-inventing the wheel and all of us would benefit.

(4) We must very carefully examine some of the opportunities which we have in the technology of using interactive Videodisks. I suggest that this is an area which we have to examine carefully. Interactive videodisks together with computers offer opportunities and simulation which are beyond our imagination at this point.

(5) All software should be evaluated in terms of its applications to special needs children and I urge this be included in the revised State of California software evaluation forms.

(6) Lastly, as a faculty member at an institution I am also recommending that very careful research be carried out on the value of computer programs for children with special learning needs.

Thank you.

If you have any questions concerning this presentation, contact:

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